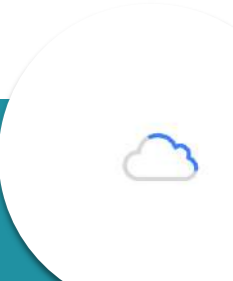
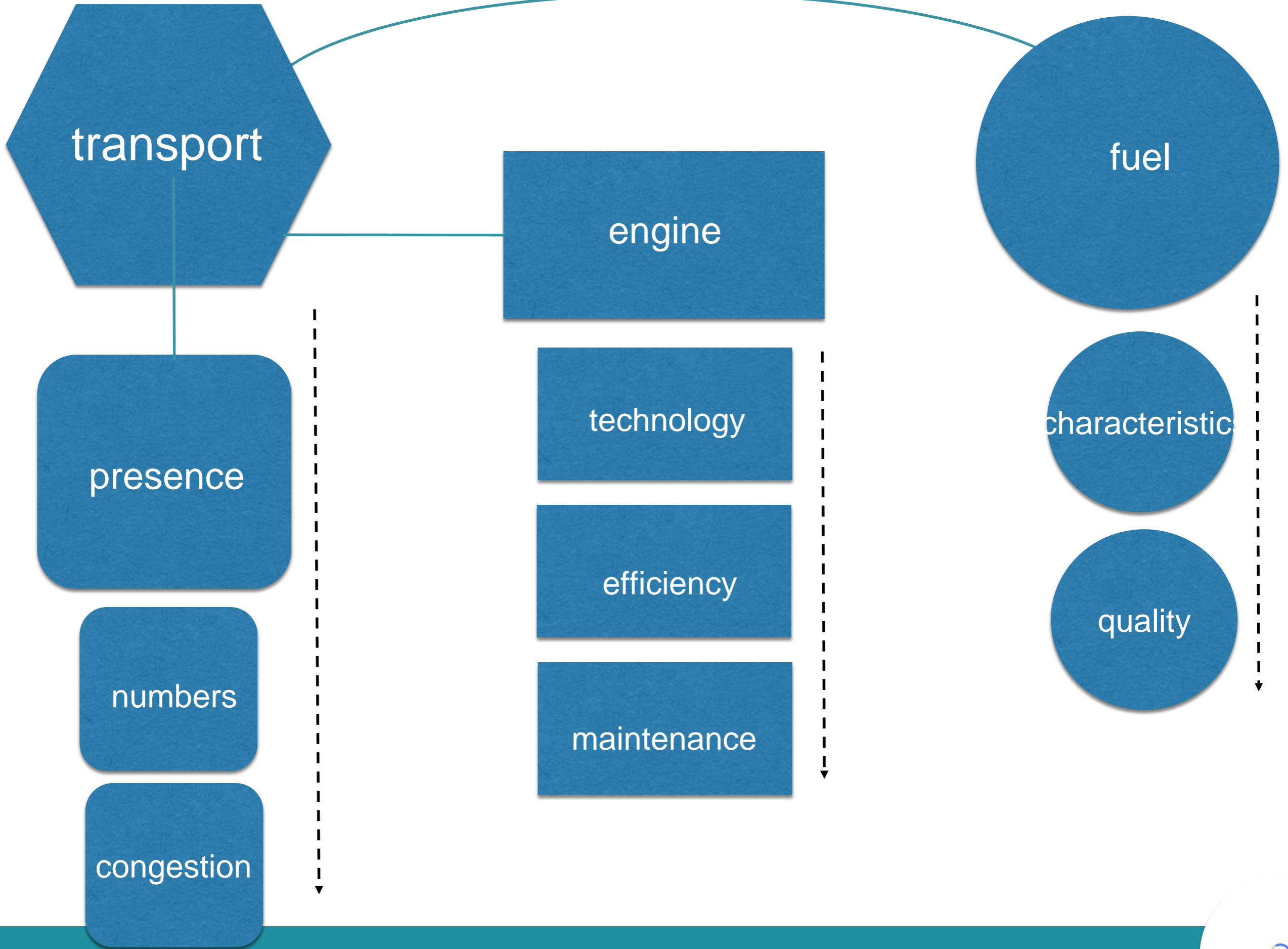


# Is there a relation between air-pollution and vehicles



Parthaa Bosu





# Projection

fuel quality

- PM2.5 to rise by 25% by 2030 over 2012 levels
- SO2 and NOx levels up three to five times
- emissions of volatile organic compounds (VOCs), rise by 30%
- annual averaged PM10 levels in all major Indian cities could reach 150  $\mu\text{g}/\text{m}^3$



# Challenges

fuel quality

- More than 40% of kerosene is lost as leakage
- 51% diesel and 33% of gasoline at retail stations are adulterated
- None of the accredited labs has the capability to detect the amount of naphtha and kerosene



# No scrapage policy yet

Vehicle Type	Population (in millions)	In percentage (%)					
		< 5 yrs	6–10 yrs	11–15 yrs	16–20 yrs	20–25 yrs	> 25 yrs
2 Wheelers	52	49	27	14	8	2	0.3
Cars	7	50	30	13	6	1	0.2
LCV	2	37	22	27	11	3	0.8

Source: Ministry of Road Transport & Highways MoRT&H, 2006

# Challenges

- huge volume of vehicles are still built to BS III standards and will continue
- use high sulfur fuels: 350 parts per million (ppm) of diesel and 150 ppm for gasoline
- Absence of an effective inspection and certification system
- impossible to ensure on-road reduction in emissions
- The difference between the lab emissions and in-use emissions from vehicles



# Why Congestion?

1. Most people reside in low-density areas that public transit cannot efficiently serve
2. Compared to most public transport offered, privately owned vehicles are
  - a. more comfortable,
  - b. faster,
  - c. more private,
  - d. more convenient in trip timing, and
  - e. more flexible for doing multiple tasks on one trip than almost any form of public transit



# Unfair Comparison

	<b>Distance</b>	<b>Metro Fare</b>	<b>DTC Fare</b>
Noida sector 18, to Sarita Vihar	9.5 kms	50.00 43 minutes	20.00 45 minutes
Janakpuri to Nangloi	11kms	40.00 44 minutes	20.00 1hr 10 minutes





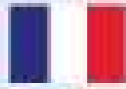

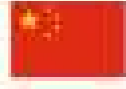

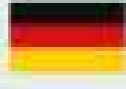











# India's love for cars

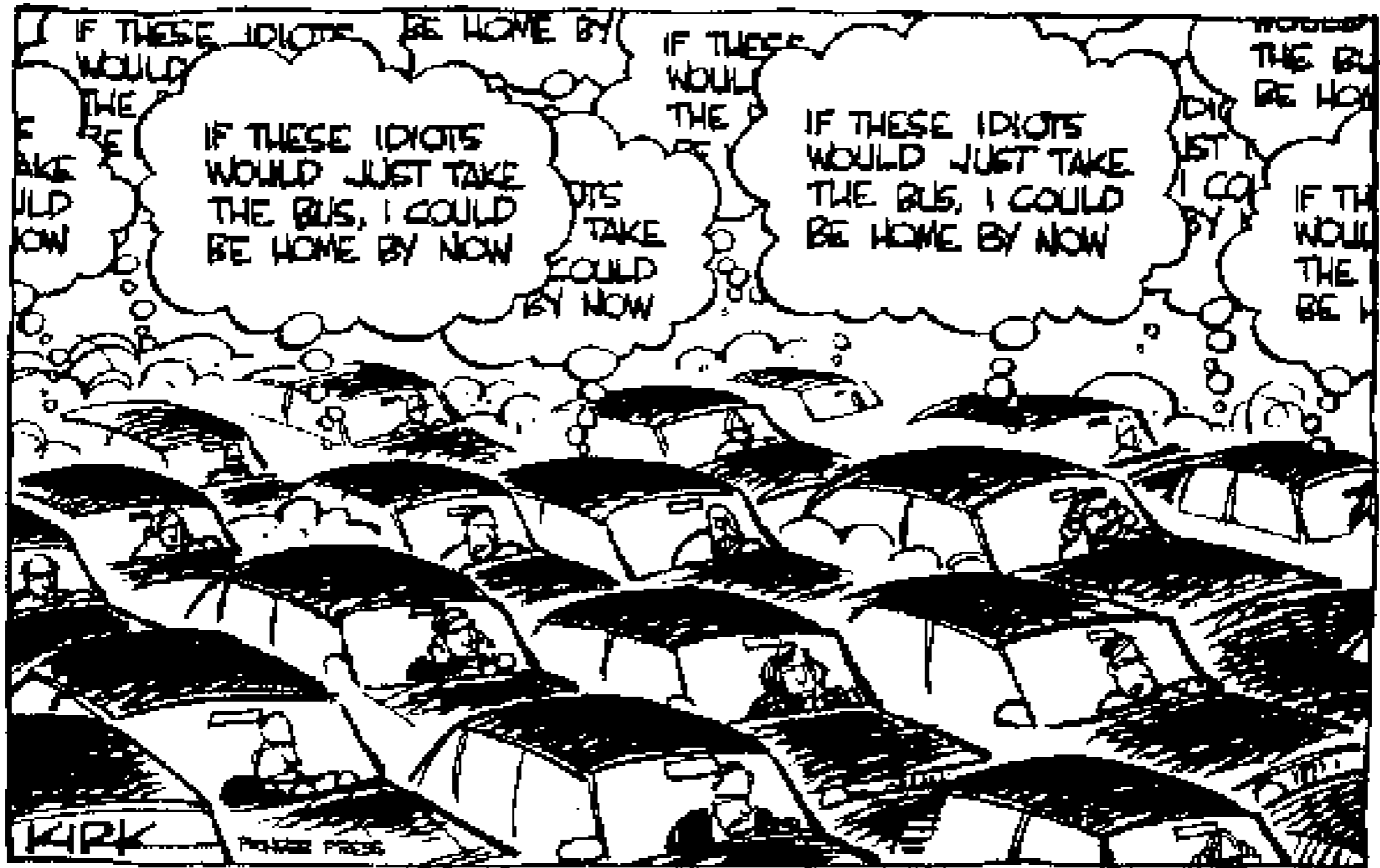
## NUMBERS GAME

The pace of growth made India the world's fifth largest passenger vehicle market by volume, surpassing Brazil where sales declined the most. China continues to be the world's biggest auto market by volume.

Ranking by % growth		% change (year-on-year)	Sales (mn) Jan-Nov 2015
1	 India	 7.64%	2.54
2	 UK	 6.20%	2.45
3	 France	 6.19%	1.73
4	 China	 5.91%	18.68
5	 Germany	 5.40%	2.95
6	 US	 -1.37%	3.87
7	 Japan	 -9.94%	3.90
8	 Brazil	 -20.86%	2.19

Source: Siam, OICA

# Same Story



# Why vehicular pollution is a serious issue

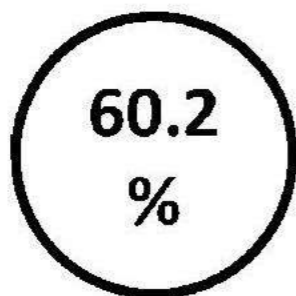
- commuters may encounter notably higher exposure to redox-active PM<sub>2.5</sub> in the on-road environment
- It is possible the composition of the local air pollution at a traffic intersection is completely different from the ambient air pollution



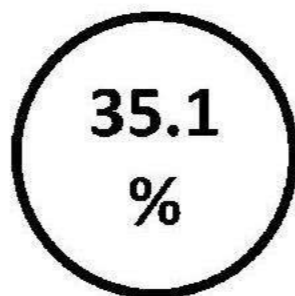
## 2015 road transport in numbers

total registered number of vehicles **8.8 million**

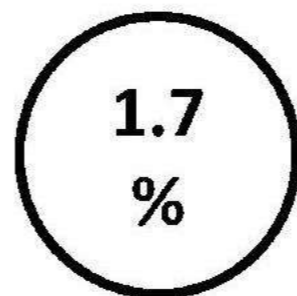
share of registered vehicles



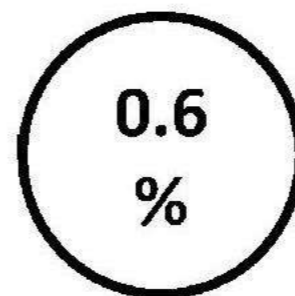
2-wheelers (2W)  
All petrol



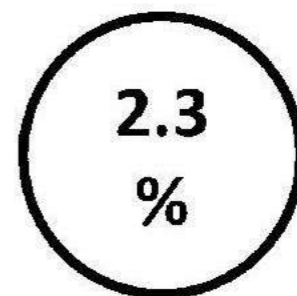
4-wheelers (4W)  
Mixed fuel  
Majority petrol



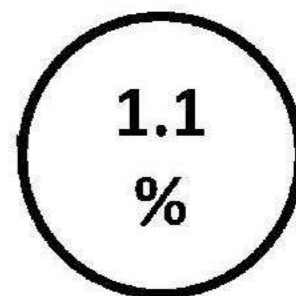
3-wheelers (3W)  
All CNG



Buses (BUS)  
Diesel+CNG  
Majority CNG

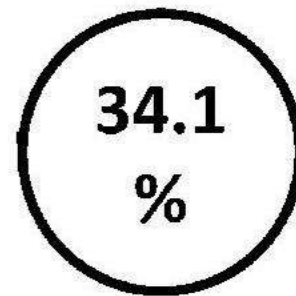
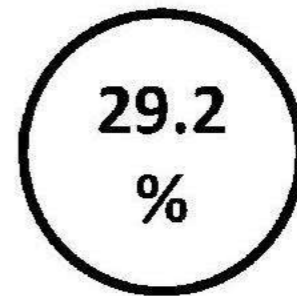
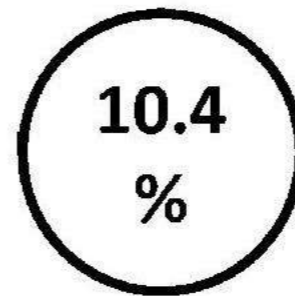
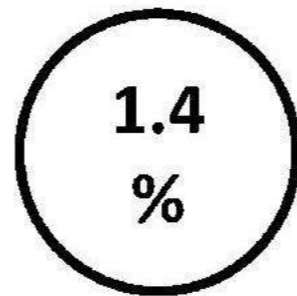
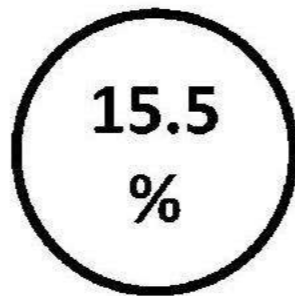
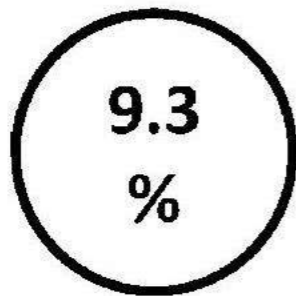


Light duty trucks (LDV)  
Mixed fuel

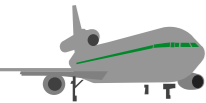




Heavy duty trucks (LDV)  
All diesel

share of PM<sub>2.5</sub> emissions



# Statistics show the biggest need/challenge in Road Freight

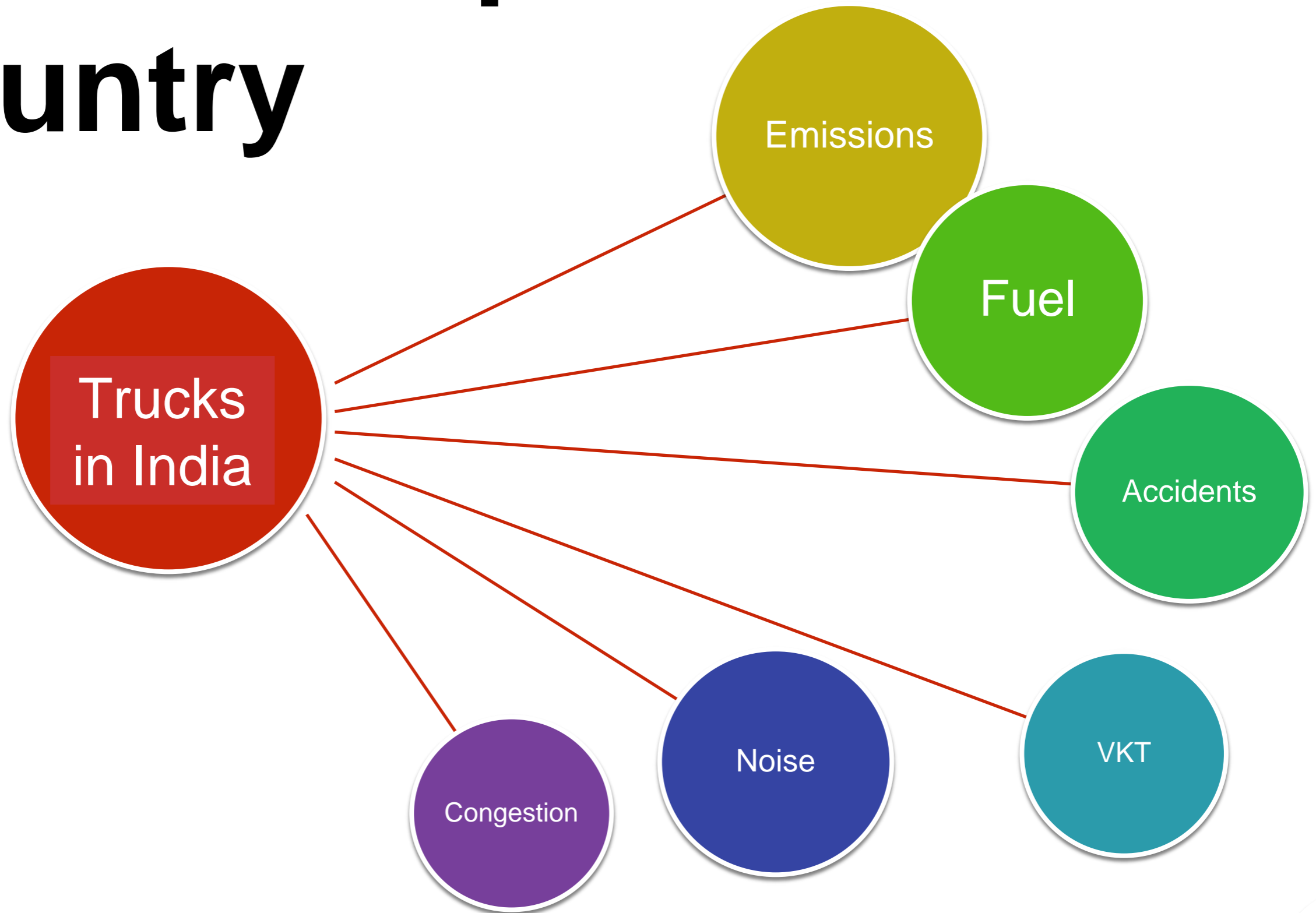
Historical Development of vehicle capacities <sup>1)</sup>					World transport energy use <sup>2)</sup>	Market diversity
1970	1990	2010	2030			
 <b>Air</b> Boeing 747-200F Max. Freight 101 t	Boeing 747-400 ERF Max. Freight 112 t	Airbus 380-800F Max. Freight 150 t	Airbus 380-800F Max. Freight 150 t	11.6%	~ 300 – 400 airlines	
 <b>Ocean</b> Container Ship 2,600 TEU - 3,100 TEU	Container Ship 2,800 TEU - 5,100 TEU	Container Ship 11,000 TEU - 14,000 TEU	Container Ship 16,000 TEU - 22,000 TEU	9.5%	~ 150 shipping lines	
 <b>Road</b> Gross Vehicle Weight 60-70 t	Gross Vehicle Weight 60-70 t	Gross Vehicle Weight 60-70 t	Gross Vehicle Weight 60-70 t	25% Heavy- and Medium freight trucks only	> 100,000 trucking companies	

## Conclusion

Road freight should be given priority because of the high energy use and high market fragmentation compared to air and ocean freight.



# Truck's impact on the country



- The Roads' Role in the Freight Transport System Rikard Engström
- PARIS PROCESS ON MOBILITY AND CLIMATE (PPMC)



# The Consumption Economy

- People want to live in urban areas
  - About 50% of world population is urban, expected to reach 80% in 20-30 years
  - Residents consume prodigious amounts of goods
- The number of deliveries made to key sectors, such as food and retail, generates more traffic than the one for marine ports and airports combined
- In terms of freight traffic, deliveries to stores may represent in excess of 60% of all the freight traffic in a metropolitan area





# Way Forward?

1. Urban Planning is key
2. National Approach
3. In-use vehicles
4. Urban Freight







It leads to the open manhole across the road... A blessing in disgust.

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